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REMARKS**Affirmation of Election**

The Office Action includes a summary of a telephone conversation between Examiner Luan V. Van and the undersigned attorney regarding a restriction requirement and provisional election. The applicant hereby affirms its election, made without traverse, to prosecute the invention of Group I, claims 1-17, in this application.

Claim Objections

Claims 2, 7-11 and 16 were objected to as being of improper dependent form for failing to limit the subject matter of a previous claim. By this response the claims are amended to address this objection. Withdrawal of the objection to the claims is requested.

§ 103 Rejections of Claims 1-11, 14 and 16-17

Claims 1-11, 14 and 16-17 were rejected under 35 U.S.C. 103 as being unpatentable over the Cowles et al. U.S. Patent 6,700,748 in view of the Shangguan et al. U.S. Patent 6,082,610. Briefly, the Cowles patent is said to teach a method for forming an electrical interconnect on a suspension that includes the step of filling a masked via with plated solder. The Shangguan patent is said to teach an electroplating method to form an interconnection bump of copper and other metals between integrated circuit boards and integrated circuits. The position was taken that it would have been obvious to modify the method shown in the Cowles patent by electroplating conductive material as taught by the Shangguan patent instead of using solder because electroplating allows the formation of a high density fine pitch interconnection.

By this response claims 8, 14 and 16-17 are canceled, so the rejection of these claims is now moot. Claims 1, 6 and 7 have been amended to more particularly point out and distinctly claim the applicant's invention, and to distinguish this invention from the references of record. In particular, claims 1-7 and 9-11 are now directed to a method for forming a plated electrical interconnect that includes *not reflowing* the interconnect. Instead, conductive material is electroplated *onto the spring metal layer*. The recited electroplating

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step includes building up the conductive material *over the spring metal* layer to a height about equal to or greater than the upper surface of the conductive lead layer. A method having these features and associated advantages is neither taught nor suggested by the Cowles or Shangguan patents or the other prior art of record.

The Cowles patent discloses a method for plating solder to form a via connecting the copper and stainless steel layers in an integrated lead suspension (ILS). This process is described in connection with the "Plated Solder" and "Reflow Solder" drawings in Figure 2. In the specification at column 3, lines 66-67, it is stated that "plated solder" can be used for the interconnection. There is no statement that an electroplating process is used for this purpose. The "plated solder" statement could just as well refer to what is known as an electroless plating process. The drawings in Figure 2, however, do show what appears to be a voltage source connected between the stainless steel and copper layers of the ILS. So for purposes of this response, but without conceding the point, the applicant will assume that the reference shows electroplating solder.

However, even under these circumstances the process shown in the Cowles patent is different than that of the applicant's invention. The recited process includes electroplating conductive material *on the spring metal layer* to form the interconnect. This step includes *building up the conductive material over the spring metal layer* to a height about equal to or greater than the upper surface of the conductive lead layer. The process disclosed in the Cowles patent, on the other hand, as is evident from the "Plated Solder" drawing in Figure 2, involves plating solder on the copper layer (e.g., the solder labeled 310 in the Figure), apparently until that solder meets the stainless steel layer. The portion of the solder on the stainless steel layer does not even extend beyond the polyimide layer, much less to the height of the copper layer.

Furthermore, claim 1 has been amended to recite a method including *not reflowing* the plated interconnect. The plated solder method shown in the Cowles patent, on the other hand, includes the step of reflowing the solder. In the sentence spanning columns 3 and 4, the specification states that "[w]ith either method, the solder is reflowed 318 for increased

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adhesion” The applicant’s recited electroplating method provides an interconnect with secure adhesion properties without any need to reflow the plated interconnect.

The Office Action asserts that it would have been obvious to substitute the conductive material taught by the Shangguan patent for the solder shown in the Cowles patent. However, even assuming for purpose of analysis that this statement is correct, the resulting process would still not include the steps recited in the claims or the resulting interconnect. As was discussed above, the plating process shown in the Cowles patent plates the solder on the copper layer until it meets the stainless steel layer. The portion of the solder on the stainless steel layer does not even extend beyond the polyimide layer. This method does not produce an interconnect that extends from the stainless steel layer. The combination of the features of this patent with those of the Cowles patent therefore does not even result in a process having the steps or producing an interconnect of the type recited in the claims. This combination therefore certainly does not render the claimed invention obvious.

Moreover, there is no motivation to combine the features of the Shangguan patent with those of the Cowles patent to produce the claimed invention. The Cowles patent is directed to a method for forming a via-type interconnect on an ILS. The Shangguan patent, on the other hand, discloses a bump-type interconnect between a printed circuit board and an integrated circuit. These applications are considerably different. Withdrawal of the § 103 rejection of claims 1-7 and 9-11 is requested for all these reasons.

Claim 6 depends from claim 1 and further characterizes the electroplating step as including electroplating the first conductive material on the spring metal layer and not in contact with the conductive lead layer. The recited purpose of this step is to form a plated bond pad interconnect that is electrically isolated from the conductive lead layer.

A method having these additional features and advantages is neither taught nor suggested by the combination of the Cowles and Shangguan patents. The Cowles patent teaches a method for forming an electrical interconnection between the stainless steel and copper layers of an ILS, not an electrically isolated bond pad interconnect as in the recited method. The Shangguan patent does not even suggest a method for forming a plated bond pad interconnect on an ILS. The combination of the features of these references in the

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manner suggested in the Office Action therefore does not even include all the features of the method recited in claim 6. This combination therefore does not render the claimed invention obvious. And as noted above, there is no motivation to combine these references either. Withdrawal of the rejection of claim 6 is requested for these additional reasons.

Claim 7 depends from claim 1. This claim and its dependent claims 9-11 further characterize the electroplating step as causing the first conductive material to build up on the spring metal layer, and with continuing build up to reach a thickness at which the conductive material electroplates onto and builds up on the conductive lead layer. The recited purpose of this step is to form an electrical interconnect between the spring metal layer and the conductive lead layer.

For reasons similar to those discussed above in connection with claim 1, a method having these additional features and advantages is neither taught nor suggested by the combination of the Cowles and Shangguan patents. The Cowles patent does not disclose an electroplating process whereby the interconnect is built up on the stainless steel layer. Instead, it shows a process where solder is plated on the copper layer until it meets the stainless steel layer. The portion of the solder on the stainless steel layer does not even extend beyond the polyimide layer. Moreover, these deficiencies are not cured by the Shangguan patent. Withdrawal of the rejection of claims 7 and 9-11 is requested for these additional reasons.

§ 103 Rejections of Claims 12 and 13

Claims 12 and 13 were rejected under 35 U.S.C. 103 as being unpatentable over the Cowles and Shangguan patents, and further in view of the Gay et al. U.S. Patent 4,764,260. The Gay patent is said to teach a method for anodic cleaning a stainless steel substrate. The position was taken that it would have been obvious to modify the Cowles and Shangguan method by removing oxide as shown by the Gay patent before electroplating.

These claims, however, depend directly or indirectly from claim 1, and have features and advantages that are neither taught nor suggested by the references of record. Withdrawal of the rejection of these claims is therefore requested.

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§ 103 Rejections of Claim 15

Claim 15 is canceled by this response, so the rejection is now moot.

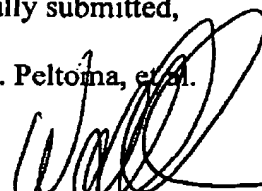
Conclusion

By the amendments made herein and for the reasons presented above, remaining claims 1-7 and 9-13 are now in condition for allowance. Notice to that effect is respectfully requested.

Respectfully submitted,

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